ATOMIC ENERGY letter

THE FIRST AND ONLY [illegible]

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Dear Sir:

In a move emphasizing the increased industrial participation in the U. S.'s Aircraft Nuclear Propulsion Project (ANPP), Reaction Motors, Inc., Rockaway, N.J., have now sent their chief research engineer, J. H. Wyld, to work on this project, on a one year loan basis, at Oak Ridge National Laboratory, reactor technology division. At the same time, the Glenn L. Martin Co., Baltimore, have sent the chief of their power plant design section, R. W. Schroeder, to this project. Work on the ANPP at Oak Ridge National Laboratory is the U. S. Atomic Energy Commission's portion of this undertaking, which is a joint enterprise of the National Advisory Committee for Aeronautics, the U. S. Air Force, the Navy's Bureau of Aeronautics, and, as mentioned, the USAEC. Work at Oak Ridge deals specifically with reactor design, and reactor materials and shielding. Such problems (for nuclear powered aircraft) as airframe design configuration, engine design, and power cycles are assigned to the other agencies, who contract much of it out. Now, under a prime cost-reimbursement contract from the U. S. Air Force, Fairchild Engine and Airplane Corp., in the largest current research project of that firm, are engaged in aircraft nuclear propulsion investigations, also at Oak Ridge. A group of aircraft engine manufacturers, designated by the U. S. Air Force, participate with Fairchild in the project.

An annual managerial fee of $79,000.00 for operating K-29, and an annual fee of $244,800.00 for K-31, the two new uranium-235 separation plants at Oak Ridge, will be paid Carbide and Carbon Chemicals Division, recent signing of its AEC contract has revealed. (Carbide now receives $1,152,000.00 annually for operating the K-25 & K-27 uranium-235 separation plants at Oak Ridge; AEN 3/14/50, p. 2)

A reduction in size and weight of atomic weapons produced by the AEC makes these smaller bombs capable of being carried by fighter-bomber aircraft, and other fast and maneuverable 'planes, Washington officials disclosed last week. AEC acting Chairman Pike also confirmed last week the variety of these weapons which the AEC makes for the U. S. Military Establishment. Meanwhile, stockpiling of such weapons continues, with main U. S. storage depots in underground chambers in such areas as the Manzano and Sandia mountains in New Mexico, near Sandia Base, N. M., the atomic weapon assembly center.

Estimating that in the event of an atomic weapons attack on the City of New York, some 100,000 persons would be killed outright, and as many more seriously wounded, Dr. Marcus C. Kogel, the City's Commissioner of Hospitals last week advanced a plan of action for such an occurence. Speaking in New York to some 119 hospital representatives, under the auspices of the Greater New York Hospital Association, he dwelt on the problem of treating 35,000 to 40,000 victims of burns. He suggested that medical men study latest methods, and that hospitals train civilian teams to handle cases of shock and burns.

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AT THE ATOMIC CITIES & CENTERS IN THE UNITED STATES...

ARCO, Idaho- Ground has now been broken, at the nuclear reactor testing station here, for the materials testing reactor building, the second nuclear reactor, in point of time, on which actual construction here has begun. Work is being done by the Fluor Corp., Ltd. (At the experimental breeder reactor, the first such facility underway, steel is now being erected. Primary function of the MTR will be to provide a tool for pre-testing of reactor materials, and component assemblies, under the neutron flux, temperature and other conditions comparable to those to which they will be exposed. As presently planned, the MTR can provide fluxes of both thermal neutrons and fission neutrons comparable to those met in any reactor likely to be built in the near future. To increase the neutron-producing ability of the MTR, heavy water will be used as coolant material. While now designed to use ordinary water, the heavy water will be provided for it by the U. S.'s new $5,000,000.00 heavy water production plant (AEN 3/28/50, p. 2) which will use the low temperature distillation of extremely large volumes of hydrogen, and which is expected to be in operation in time to meet the MTR's needs.

RICHLAND, Washington- As part of the major laboratory expansion, here at Hanford Plutonium Works, a technical center is planned which will consolidate all present programs and permit necessary new ones to be carried out. During the original World War II program here, the laboratory facilities were a bare minimum to support the original project. Since then, the expanded program, plus 5 years depreciation, has made the laboratories inadequate for proper control of existing and new processes, and for coping with the hazards associated with the plutonium production and allied processes. A beginning was made in 1949, when construction was started on a radiobiology laboratory and an experimental animal farm. Now, additional laboratory facilities are required in the fields of radiochemistry, radiophysics, and radiometallargy, as well as a health instrument control and development laboratory, and a pile technology unit. The technical center, which will incorporate these, and other facilities, will involve an overall expenditure of approximately $15,000,000.00, with an allocation of $5,500,000.00 for fiscal 1951 spending.

OAK RIDGE, Tennessee- At the Oak Ridge National Laboratory here, the program in physics (which is built around the 24-hour operated research reactor and allied equipment) will comprise, for the latter part of 1950, such work as: Installation and testing of a 2 Mev Van de Graaff accelerator; neutron diffraction studies; studies of radioactive decay schemes; solid state research; work on a slow neutron velocity selector; and other programs.

A new cancer research project here will pioneer the use of radioactive cobalt in a therapy unit comparable to an x-ray unit operating in the one to two million volt range. It will be a joint endeavor of the Oak Ridge Institute of Nuclear Studies, and the University of Texas' M. D. Anderson Hospital at Houston; their AEC-contract calls for the construction, testing and ultimate use of the radiocobalt irradiator for cancer research and treatment. Meanwhile, invitations have been issued to contractors to bid on construction of the telecobalt therapy building to house the unit (AEN 5/9/50). The radiocobalt irradiator itself will consist of a spherical shield of some heavy metal, such as lead, with the radioactive cobalt enclosed in the middle. The shield will be approximately a foot in diameter, with a slit through which radiation will pass. This will allow a small, but very intense, beam of penetrating gamma radiation to be directed upon the tissue being irradicated. The unit will be particularly suited for irradiating deep seated tumors, such as pelvic tumors, and will have the advantage over an x-ray machine since its beam, which will be more localized and more penetrating, will permit pin-pointing the radiation. Over 1,000 curies of radiocobalt will be required for the unit. Since this device requires radiocobalt of a high specific activity per unit weight, it may be necessary to obtain it from the higher flux Canadian nuclear reactor, at Chalk River, Ontario, Canada.

Research with radioisotopes having high-level radiation will be carried out in a new Isotope Research Facility and Semi-Works, to be constructed here. Invitations (no. 401-50-1A) have been issued to bid on construction of this building; closing date is June 15th, 1950.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

INSTRUMENT BUYING by the U. S. Government- Under bid invitation no. 532, closing date June 1st, 1950, the Commanding Officer, Chemical Corps Procurement Agency, Army Chemical Center, Md., asks for bids to supply 23 fume hoods (AEC-approved) of stainless and cold-rolled steel, for radioactive isotope experimental work. Also, under bid invitation no. 545, closing date May 29th, 1950, this organization will accept bids on supplying 2 counting rate computing systems, including scales, scalers, decimal counting unit, etc., as well as 1 timer for the system.

Under bid invitation no. FW6-501, closing date May 31st, 1950, the Purchasing Officer, Dept. of the Interior, Fish & Wildlife Service, Room 3247, Interior Bldg., Washington 25, D. C., has asked for bids to supply 2 beta, gamma counter scalers.

NEW PRODUCTS- Pocket-size gamma detector, model K-550, uses sub-miniature type 300 Geiger tube. Normal background response of instrument, 12 counts per minute. Uses two 30-volt Minimax batteries for "B" supply, and one 1½-volt flashlight cell for "A" power. Instrument is 4 3/4" x 2 5/8" x 1 1/8"; weight is 10-ounces. Supplied with hearing-aid type earphone for detection.--Kelley-Kcett Man. Co., Covington, Ky.

Radioactive warning signs and tags bearing the official magenta insignia on a brilliant yellow background. Available as 8½" x 11" signs; as 2 5/8" x 5½" strung tags; and as 2" x 2½" waste labels. Recommended to users of radioisotopes and other radioactive material. Available at cost.--Atomic Instrument Co., Boston 14, Mass.

Reco Neutra-Stat; a unit to dissipate static electricity. Consists of an alpha-radiating static eliminator strip affixed within the slot of a movable head. By controlling the flexible tube supporting the head, the static eliminator may be directed toward any area where static electricity is to be discharged. Life of static eleminator said to be 18 months or more.--E. Machlett & Son, New York 10.

Stainless-steel cathode Geiger-Muller tubes. Produced by a new process in which stainless-steel is evaporated on the inside of the glass walls of Geiger tubes, and on the mica windows. Has enabled the substitution of a stainless-steel cathode coating for the previously used Acquadag coating. Life of the mica window type tube extended by a factor of ten over the old Acquadag type, it is said. The all-glass tubes also have a greatly increased life.--Tracerlab, Inc., Boston 10, Mass.

EXPERIMENTAL WORK- Collection efficiencies, in removing radioactive dust from industrial atmospheres, must exceed 99.9%, M. J. Kaplan, Mallinckrodt Chemical Works, told the American Industrial Hygiene Foundation in Chicago recently. These efficiencies, he said, must be achieved because of the low pollution tolerances for this material, and the fact that the dust may be valuable, or accountable for, because of security reasons. Kaplan reported that Mallinckrodt had found a Hersey reverse jet-principle collector, working under a dust load between 0.07 and 32 grains per cubic foot at air-to-bag ratios of 16 to 27 c.f.m. per square foot, gave the best performance in this service. Efficiencies up to 99.998% were reported.

Composed of 24 counter tubes connected in parallel, a counter was designed by T. Graf, of the L. Meitner Laboratory, Royal Institute of Technology, Stockholm, Sweden, to measure the gamma radiation of substances of very low specific activity. The tubes have Bi-plated brass screen cathodes, and are placed inside the same envelope. Compared to a single brass counter of similar dimensions, the multiple counter shows, for gamma rays of, say, 0.7 Mev energy, a ten-fold increase in efficiency, with a starting voltge 500-600 volts lower. (Graf notes, however, that at low energies, in the range 0.2 to 1 Mev, it may prove difficult to obtain an efficiency comparable to that of a good scintillation counter.

At the Naval Radiological Defense Laboratory, San Francisco, Calif., the RCA 1P21 photo-multiplier tube has been investigated as a detector of high intensity gamma-radiation. J. D. Graves, and G. E. Koch, who performed the experiments, report that its wide range, linearity of response, and directional properties, appear to make it a suitable gamma-radiation detector.

building; closing date is June 15th, 1950.

ATOMIC PATENT DIGEST...latest U.S. & British applications & grants...

SPECIAL NOTES- The Patent Compensation Board of the USAEC has received an application from A. A. Matheson for just compensation based on his U. S. Patent No. 2,304,839, issued Dec. 16th, 1942, entitled "Air Control Valve." (Docket No.8).

Now available to interested manufacturers are 18 additional U. S. Government-owned patents, developed under the USAEC's sponsorship, and assigned to that agency. Available royalty-free (but on a non-exclusive basis). For detailed description of this 18-lot, as well as of a previous 104 so released, write T. P. Reynolds, U. S. Patent Office, Washington 25, D. C. License negotiations are to be made with Chief, Patent Branch, USAEC, Washington 25, D. C. These 18 patents comprise: No. 2,499,830, Air proportional counter; No. 2,499,833, Fluorinated organic compounds; No. 2,499,836, Preparing uranium chlorides; No. 2,499,859, High speed mercury diffusion pump; No. 2,500,492, Apparatus for handling materials; No. 2,500,756, Rectangular pulse amplifier; No. 2,501,461, Valve; No. 2,503,077, Perhalogenated ethylcyclopentane; No. 2,503,078, Preparing cyclic compounds; No. 2,504,530, Vacuum leak detector method; No. 2,504,585, Cyclotron target; No. 2,505,877, Vapor phase fluorination; No. 2,505,919, Proportional counter; No. 2,506,419, Detecting ionizing particles; No. 2,506,428, Condensation product; No. 2,506,431, Pressure measuring device; No. 2,506,433, Magnetic flux measuring apparatus; No. 2,506,435, Radiation measurement.

NEW PATENTS & APPLICATIONS-An improvement in well logging. A chain of spaced radiation detectors are passed along a borehole so that the responses of the individual detectors to radiation from the same level in the bore hole are displaced in time. The individual responses from that level are then automatically combined. U. S. Pat. No. 2,506,149, issued May 2nd, 1950; assigned to Texaco Dev. Corp., N.Y.

Production of elemental fluorine, by electrolyzing a mixture of hydrogen fluoride, potassium fluoride, and lithium fluoride, with a steel cathode and an anode composed of carbon containing from about 25 to 47% copper in the form of a network. Temperature of process is from 95 to 115 degrees C. U. S. Pat. No. 2,506,438, issued May 2nd, 1950; assigned to United States of America (USAEC).

Subsurface prospecting device for logging various geological formations traversed by drill holes. An ionization chamber, in a sealed casing, is exposed to radiation, and the electrical current produced is recorded. U. S. Pat. No. Re. 23,226, issued May 9th, 1950; assigned to Lane Wells Co., Los Angeles, Calif.

Neutron meter. Comprises spaced regions each containing a gaseous boron compound, with at least one intermediate region formed of a non-gaseous hydrogen-containing compound. Means are provided for measuring the ionization of the gaseous boron compound. U. S. Pat. No. 2,506,944, issued May 9th, 1950; assigned to United States of America (USAEC).

Process for extracting uranium and radium values from pitchblende ores. The ore is reacted with nitric acid in the presence of an additive from the class consisting of ammonium nitrate and sodium nitrate and a mixture of the two, to dissolve (and subsequently recover) radium and uranium values. U. S. Pat. No. 2,506,945, issued May 9th, 1950; assigned to United States of America (USAEC.)

BOOKS & OTHER PUBLICATIONS...in the nuclear field...

The Acceleration of Particles to High Energies. One of the "Physics in Industry" group; based on a session arranged by the Electronics Group at the British Institute of Physics Convention early in 1949. 58 pages.--Institute of Physics, 47 Belgrave Sq., London, S.W.1, England. (10s. 6d. or U.S.A.$1.60)

Radioactive Isotopes for Determination of Submicroscopic Quantities of Material Transfer, by R. A. James, Chrysler Corp. Industrial Applications of Radioisotopes, by William Reid, Ford Motor Co. Radioisotopes, by Dr. Keith-Symon, Wayne University. Papers presented at Society of Automotive Engineers meeting in Detroit, Fall, 1949.--SAE Special Publications Dep't., 29 W. 39th St., New York 18. (50¢ ea.)

IONIZING RADIATION...investigations & notes...

Studies of the x-ray sensitivity of Tradescantia chromosones during the mitotic cycle of the pollen grain division have been made by C. J. Bishop, Acadia University, Nova Scotia. Potted plants, (of the diploid species, Tradescantia paludosa) were used, and were treated with 250 r of x-rays at a distance of about 65 cm., and at an intensity of approximately 30 r/minute. It was found that there is a period of low sensitivity during the postmitotic resting stage, and two points of high sensitivity, one at the time of chromosone doubling, and the other at pollen grain division, with the latter the greater of the two.

Using x-radiation, and the injection of nitrogen mustards, to suppress antibody formation in the experimental animals, an effort has been made to determine whether the lesions observed in the rabbit, after a single large intravenous injection of foreign protein, are dependent on the formation of antibodies. The work was done at Harvard Medical School by L. Schwab, F. C. Moll, T. Hall, et al. The investigators found that both x-radiation and nitrogen mustard administration inhibit the formation of precipitins for whole bovine serum gamma globulin in the rabbit.

RADIOISOTOPES...as used for tracer & therapy applications...

Using radioactive carbon (carbon-14), D. D. McColister, and others, of Dow Chemical Co., have made a comprehensive study of the vapor toxicity of carbon tetrachloride. They reported on their work to the American Society for Pharmacology and Experimental Therapeutics, at its recent Atlantic City meeting. By the use of the radioactive carbon they have been able to trace the absorption, distribution, and elimination of carbon tetrachloride in test animals.

Studying the action of nicotine in rats and guinea pigs, with the aid of radioactive carbon (carbon-14), Aaron Ganz, University of Chicago, reported to this Society (above) on work he has done. By injecting rats with nicotine containing radioactive carbon, Ganz said, he found that the nicotine tends to collect in the lungs, heart, liver, spleen and kidneys, as well as in the body secretions. In one experiment, he stated, he found that the heart of the guinea pig initially absorbed nicotine from fluids passing through it, but that after a short time it stopped absorbing the chemical.

A rapid method of determining blood volume by the use of radioactive phosphorous (phosphorous-32) labelled red cells has been developed by A. F. Reid, and Marjorie K. Orr, of Baylor University Graduate Research Institute and Southwestern Medical School, University of Texas, Dallas. The method consists of, (a) incubating red cells with P-32 until a sufficient amount of P-32 has been incorporated by the cells, (b) injecting a suspension of the washed cells into the subject, waiting for uniform distribution of the cells in the circulating blood, and withdrawing a sample, and (c) measuring relative radioactivity of the cells in the injected sample and the withdrawn sample. The investigators state that several errors and time consuming procedures inherent in other methods using this tracer have been eliminated.

Commander H. C. Dudley, who has worked with radioactive gallium for the Navy for some three years, has been appointed a consultant to the Medical Division of the Oak Ridge Institute of Nuclear Studies. He will assist in further research on the element by the Medical Division. (Radioactive gallium is of special interest to the medical profession because of its short half-life, 14.3 hours, and a tendency to concentrate in bony structures. Past research has indicated that it may eventually prove to be of value in the treatment of certain bone disorders. Its short half-life makes control of the radiation dosage much easier, and reduces the possibility of prolonged residual radiation effects.)

Sincerely,

The Staff,
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